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The United States of America

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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

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Attest

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United States Patent [19]

Krupke et al.

[11] Patent Number: 6,134,835

[45] Date of Patent: Oct. 24, 2000

[54] COUNTERBALANCE SYSTEM FOR UPWARD ACTING DOOR

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[73] Assignee: **Overhead Door Corporation**, Dallas, Tex.

[21] Appl. No.: **09/096,663**

[22] Filed: **Jun. 12, 1998**

[51] **Int. Cl.**[7] **E05F 11/00**

[52] **U.S. Cl.** **49/200**; 49/197; 160/191

[58] **Field of Search** 49/197, 200; 160/191, 160/192, 201; 16/DIG. 1

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[57] **ABSTRACT**

A counterbalance system for an upward-acting door includes spaced-apart wall brackets and cable drums supported on the brackets and connected to flexible cables which depend from the drums and connected to the lower side edges of an upward-acting sectional garage door. One or both of the cable drums may be connected to one end of a torsion coil spring and the opposite end of each spring is connected to a hub assembly. Elongated spring winding and protective cover tubes are sleeved over the springs and are connected to the brackets by worm-gear drive winding mechanisms, respectively, for rotating the tubes to effect winding of the torsion coil springs through the hub assemblies but preventing rotation of the tubes during normal operation of the counterbalance system. The cable drums and spring hub assemblies may be supported on an elongated synchronizing shaft or a torque transfer shaft extending between and supported on the wall brackets.

33 Claims, 10 Drawing Sheets